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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/659,377

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Eric B. Johansson

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30024

7590

01/14/2005

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EXAMINER

BEHREND, HARVEY E

ART UNIT

PAPER NUMBER

3641

DATE MAILED: 01/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

D.W

**Office Action Summary**

Application No.

09/659,377

Applicant(s)

JOHANSSON ET AL.

Examiner

Harvey E. Behrend

Art Unit

3641

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --****Period for Reply**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10/28/04 and 7/6/04.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 15, 16, 35, 36, 38-44, 109 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 15, 16, 35, 36, 38-44, 109 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

Art Unit: 3641

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 15, 16, 35, 36, 38-44, 109 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are vague, indefinite and incomplete as to the exact structure that is meant by and is encompassed by the term "twisted tabs". This is because the term "twisted tabs" has been used in the nuclear fuel assembly spacer art to refer to widely varying structural shapes (e.g. note the "twisted" tabs or vanes referred to in col. 5 lines 12+ of Krawiec et al (U.S. 3809609), the "twisted" vane in Fig. 5A (col. 4 lines 28+) of Johansson et al (U.S. 5186891), and the "twisted" vane in col. 2 lines 58+ of Clark (U.S. 33444855).

There is no proper antecedent basis in claim 16 for "said means". There is no proper antecedent basis in claim 36 for the phrase "said spaces without said swirl vanes" nor, for the term "swirl vanes".

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

Art Unit: 3641

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 15, 16, 35, 36, 38-41, 44, are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson et al (U.S. 4675154) in view of Johansson (U.S. 5032351).

Nelson et al show a boiling water reactor fuel assembly having part length rods (221) and a water rod (47) (e.g. see Figs. 1, 7 and col. 7). The fuel assembly has ferrule type spacers (e.g. see col. 4 lines 29+).

Johansson also show a boiling water reactor with ferrule type spacers.

Johansson show that it is advantageous to replace some of the ferrules (tubes) in the spacer, with twisted metal strips (e.g. see col. 2 lines 13-35, col. 3 lines 47-53, col. 6 lines 9-33). Col. 4 lines 47-52 states it is known to use fuel arrays of varying density such as 8x8, 9x9 and 10x10 fuel rod arrays.

Art Unit: 3641

Accordingly, it would have been prima facie obvious to have modified all of the ferrule type spacers in Nelson et al by replacing some of the ferrules with twisted metal strips as shown to be old and advantageous in this art by Johansson.

As to claim 38, to have modified Nelson et al by using a more up-to-date 10x10 matrix would have been prima facie obvious in view of the above referenced teachings of Johansson.

The limitations of claims 39 and 40 read on the number of part length rods (4) shown in Fig. 9 of Nelson et al.

6. Claims 15, 16, 35, 36, 38-41, 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson et al (U.S. 4675154) in view of Orii et al (U.S. 5112 571), alone or with either Clark (U.S. 3344855) or Krawiec et al (U.S. 3809609).

Nelson et al has been discussed above.

Orii et al show a fuel assembly for a boiling water reactor with ferrule type spacers. Orii et al show it is advantageous to provide the ferrules themselves with twisted tabs (vanes) or, to provide twisted tabs (vanes) within the spaces between the ferrules (e.g. see Figs. 1, 2, 3, 4, 5, 6, 7, 8 and col. 2 line 57 to col. 3 line 26, col. 5 lines 18-68, col. 6 lines 1+). Note that in either instance, the twisted tabs are all within the confines of the ferrule spacers and within the interstitial volume between the fuel rods.

It would have been prima facie obvious to have modified all of the ferrule type spacers of Nelson et al by forming twisted tabs from cut portions of the ferrules themselves (in the manner shown by Orii et al) or to have positioned twisted tabs within

Art Unit: 3641

the spaces between the ferrules (in the manner shown by Orii et al), so as to obtain the advantages thereof as taught by Orii et al.

If necessary, resort may be had to either Clark (note col. 2 lines 58+) or Krawiec et al (note col. 5 lines 12+) for a showing that the cut bent-out portions (tabs) in Orii et al are considered in this art as being "twisted".

Note that the use in the primary reference of 8x8, 9x9 or 10x10 matrices, etc., would have been obvious on its face as it merely makes use of conventionally known alternatives.

7. Claims 35, 36, 38-40, 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Dix et al (U.S. 5017332) or Wolters et al (U.S. 5164155) in view of Johansson et al (U.S. 4913875).

The primary references each show boiling water reactor fuel assemblies with spacers positioned along their length, water rods and up to 12 part length rods (note the drawings of each reference). Wolters et al also refer to the use of a 10x10 fuel rod array (note the abstract).

Johansson et al also show a fuel assembly for a boiling water reactor. Johansson et al show a spacer design which is stated as being an improvement over current spacers because it deposits more water on the fuel rods and has a lower pressure drop (e.g. see col. 2 lines 48+, and col. 3 lines 1+). This spacer is formed of a matrix of helically twisted tabs (e.g. see col. 2 lines 5-44, and, the drawings).

It would have been prima facie obvious to have modified all of the spacers of either primary reference by utilizing instead, the improved spacer formed of a matrix of

Art Unit: 3641

helically twisted tabs as shown by Johansson et al, so as to obtain the stated advantages thereof as taught by Johansson et al.

Note that the use of a 10x10 matrix would have been prima facie obvious on its face as it merely makes use of conventionally known and more up-to-date alternatives. Indeed, such is already shown by the primary reference, Wolters et al.

8. Claims 15, 16, 35, 36, 38-44, 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japan 1-176986 in view of either Orii et al (U.S. 5112571) or Johansson (U.S. 5032351).

The last two mentioned references have been discussed above.

The primary reference shows a boiling water reactor fuel assembly with a water rod and part length rods. The English language translation states that it is advantageous for a spacer supporting upper portions of the part length rods, to have protrusions so as to direct liquid coolant towards the full length rods (e.g. see pages 5-9 of the English language translation).

The secondary references (as has been discussed above) show it is known in this art that these desired protrusions on a spacer can advantageously be formed by utilizing twisted flow tabs.

Accordingly, it would have been prima facie obvious to have utilized as one of the spacers supporting the upper portions of the part length rods, a spacer with twisted flow tabs as in either secondary reference.

Note that the use of a 10x10 matrix would have been prima facie obvious on its face as it merely makes use of conventionally known and more up-to-date alternatives.

Art Unit: 3641

The limitations of claims 39 and 40 read on the number of part length rods shown in Fig. 2c of the primary reference.

9. Claims 15, 16, 35, 36, 38-44, 109 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson et al (U.S. 4675154) in view of Johansson (U.S. 5032351) as applied to claims 15, 16, 35, 36, 38-41, 44 above, and further in view of Japan 1138493.

The secondary reference of Japan 1138493 (a BWR) shows that it is old and advantageous and hence obvious for the fourth and fifth spacers in a seven spacer fuel bundle to have flow tabs for high mixing of coolant. Japan 1138493 also shows it is old and advantageous for the uppermost spacer to be formed of inconel and to not have flow tabs (e.g. see pages 3, 4, 5, 6 of the English language translation) and, to have so modified the primary reference would have been prima facie obvious so as to enable the artisan to obtain the advantages thereof as taught in said pages 3-6 of the English language translation of Japan 1138493.

It is noted that the fourth and fifth spacer of a seven spacer fuel bundle, would conventionally be at the upper portions of the part length rods. Thus, the statement in Japan 1138493 that it is advantageous to provide flow tabs on the fourth and fifth spacer of a seven spacer fuel bundle is even more evidence that it would have been prima facie obvious for the artisan to have provided flow tabs on the spacer(s) supported the upper portions of the part length rods of the primary reference.

10. Claims 15, 16, 35, 36, 38-44, 109 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson et al (U.S. 4675154) in view of Orii et al (U.S. 5112571), alone or with either Clark (U.S. 3344855) or Krawiec et al (U.S. 3809609) as applied to



Art Unit: 3641

claims 15, 16, 35, 36, 38-41, 44 above, and further in view of Japan 1138493, for the reasons set forth in section 9 above.

11. Claims 35, 36, 38-44, 109 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Dix et al (U.S. 5017332) or Wolters et al (U.S. 5164155) in view of Johansson et al (U.S. 4913875) as applied to claims 35, 36, 38-40, 44 above, and further in view of Japan 1138493, for the reasons set forth in section 9 above.

12. Claims 15, 16, 35, 36, 38-44, 109 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japan 1-176986 in view of either Orii et al (U.S. 5112571) or Johansson et al (U.S. 5032351) as applied to claims 15, 16, 35, 36, 38-41, 44 above, and further in view of Japan 1138493, for the reasons set forth in section 9 above.

13. Applicant is reminded of the continuing obligation under 37 CFR 1.178(b), to timely apprise the Office of any prior or concurrent proceeding in which Patent No. 5229068 is or was involved. These proceedings would include interferences, reissues, reexaminations, and litigation.

Applicant is further reminded of the continuing obligation under 37 CFR 1.56, to timely apprise the Office of any information which is material to patentability of the claims under consideration in this reissue application.


These obligations rest with each individual associated with the filing and prosecution of this application for reissue. See also MPEP §§ 1404, 1442.01 and 1442.04.

Art Unit: 3641

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harvey Behrend whose telephone number is (703) 305-1831. The examiner can normally be reached on Tuesday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone, can be reached on (703) 306-4198. The fax phone number for the organization where this application or proceeding is assigned is (703) 306-4195.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1113.



HARVEY E. BEHREND  
PRIMARY EXAMINER

Behrend/vs  
December 13, 2004